

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: M.Sc./Pre-PhD
BRANCH: Biotechnology**

**SEMESTER : III/I
SESSION : MO/2025**

SUBJECT: BT511 IMAGING CONCEPT & DEVICES

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Draw and discuss the design of an image intensifier for producing an X ray image	[5] 2	2
Q.1(b)	Explain the material characteristics, design and working of the components enclosed in the X-ray tube.	[5] 2	2
Q.2(a)	Draw and describe the cardiac cath lab set up	[5] 2	2
Q.2(b)	Explain the steps involved in X-ray film processing.	[5] 3	3
Q.3(a)	Draw and explain the working of an ultrasound transducer in details	[5] 2	3
Q.3(b)	What is T-M mode imaging in ultrasonography? Describe the different types of echocardiography.	[5] 2	2
Q.4(a)	Discuss the physics behind PET imaging. Also discuss the advantages and disadvantages of PET.	[5] 1	2
Q.4(b)	Write in detail about five different radio isotopes used in medical imaging	[5] 1	1
Q.5(a)	Discuss the biological effects of ionizing and non-ionizing radiations. What is ALARA principle.	[5] 4	1
Q.5(b)	Write down the steps to obtain an MRI image along with a line diagram for spin-echo imaging.	[5] 1	3

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